A standard LM-2 symbol processing system consists of a micro-coded 32-bit CPU, 1 Megabyte of main memory, 80 Megabyte fast disk, high resolution B/W graphics display, keyboard, "mouse," Chaosnet local network interface and ZetaLisp programming environment with real-time editor, mail-reader, window system, interpreter, compiler, debugger, local file system and network interface software.

Current options include color graphics, additional main memory, 300 Megabyte disk, 45 IPS tape drive, and UNIBUS (TM DEC) Chaosnet interface for connecting non-Symbolics' computers to the Chaosnet. Other I/O devices may be connected to the LM-2's standard 16-bit bus or to the EIA RS-232 line.

LM-2 CPU

The LM-2 has a 32-bit CPU with 12K of 48-bit words of writable control store. The CPU includes a 1K word stack buffer, a 1K word register memory, a multiplier/quotient register, and a 32x32 barrel shifter/masker. Microcycle time is 180 ns.

The CPU consists of 6 Multiwire (TM Kollmorgen) boards which plug into CPU card cage. The 32-bit memory bus and the 16-bit I/O bus are in a separate card cage with the main memory and the disk, display and Chaosnet controller cards.

The paged virtual memory is linear, and consists of 65,536 pages of 256 words of 32 bits. The memory map translates 24-bit virtual word addresses into 22-bit real word addresses. Each memory board consists of 64K words of 32 bits plus parity. 16K MOS RAM's are used, and access time is 450 ns. for 32 bits. Maximum main memory size is 4 megabytes, virtual memory size is 64 megabytes.

LM-2 Disk Drive

The LM-2 disk controller attaches the 80 Megabyte (300 Megabyte optional) disk drive to the LM-2 memory bus. This controller can chain and can correct burst errors of up to 11 consecutive bits in a 1K byte block.

The T-80 and T-300 are an 80 megabyte and 300 megabyte Trident (TM Century Data) removable disk drive, respectively. Each has a rotational period of 16.7 ms., a transfer rate of 10 megabits/sec., a track/track seek of 6 ms. and a maximum seek of 55 ms.

LM-2 Chaosnet Interface

The Chaosnet is a 4 million bit/second local packet bus which connects groups of LM-2's and standard time-shared mainframes. The physical bus is a standard single-strand cable-TV coaxial cable tapped with a transceiver for each computer. Up to 60 Chaosnet stations can be connected on a 2400 foot (730 meter) cable.

LM-2 Utility Devices

The LM-2 also includes a microsecond interval timer, a 60-cycle time-of-day clock, 16-bit parallel TTL input and output ports, and an EIA RS-232 asynchronous serial full-duplex line with programmable speed and modem control.

LM-2 Interactive Graphics Terminal

The standard LM-2 terminal consists of the B/W graphics terminal with mouse and keyboard. The B/W bitmap has 900 rows of 800 dots connected to a high resolution flicker-free B/W monitor with true white phosphor. The optional LM-2 color display consists of a second bitmap for 454 rows of 576 color pixels each consisting of 4 bits connected through a color map with 16 entries of 24 bits (8 bits/RGB color) to an RS-170 color monitor.

The LM-2 mouse is used to point to displayed objects, and the three buttons on its back are used for giving commands. The LM-2 keyboard has 100 keys and N-key rollover.

LM-2 Physical Characteristics

The LM-2 system consists of a CPU cabinet, a disk drive cabinet and a display terminal.

Sizes

CPU and Disk Cabinets

36"H x 20"W x 33"D. 200 lbs. (CPU), 220 lbs. (T-80), 480 lbs. (T-300).

Display Module

20"H x 12"W x 15"D. 30 lbs.

Power Requirements

CPU	110 VAC, 20 amps, 60 cycles.
T-80	110 VAC, 20 amps, 60 cycles.
T-300	208 VAC, 20 amps, 60 cycles.
Terminal	110 VAC, 1.5 amps, 60 cycles.

Operating Environment

60-90 F., 10-80% humidity (non-condensing)

Dissipation

CPU	5000 BTU/hour (1700 watts)
T-80	2500 BTU/hour (850 watts)
T-300	3500 BTU/hour (1100 watts)

No service requirements under normal conditions.

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